

The case for a large polarized antiquark flavor asymmetry $\Delta\bar{u}(x) - \Delta\bar{d}(x)$

C. Weiss

Institut für Theoretische Physik, Universität Regensburg, D-93053 Regensburg, Germany

The polarized antiquark flavor asymmetry $\Delta\bar{u}(x) - \Delta\bar{d}(x)$ can be measured in polarized Drell–Yan pair or W^\pm production in pp collisions at RHIC, as well as in semi-inclusive DIS at a future EIC facility. We review the status of theoretical predictions for this flavor asymmetry, based on various models of the nucleon PDF’s at a low scale. It is shown that, contrary to previous claims, the “meson cloud” picture of the polarized antiquark distributions is consistent with a large value of $\Delta\bar{u}(x) - \Delta\bar{d}(x)$ because of the possibility of interference of πN and σN contributions to the DIS process. The large flavor asymmetry expected from this effect is in good agreement with the prediction of the chiral quark–soliton model based on the $N_c \rightarrow \infty$ limit of QCD, as well as with a parametrization which has been suggested on grounds of the Pauli blocking effect in the quark model. The convergence of the different model predictions is building a strong case in favor of a large value $\Delta\bar{u}(x) - \Delta\bar{d}(x)$. We comment on the implications for both RHIC and EIC experiments.